AMENDMENTS TO THE CLAIMS

Listing of Claims

The following listing of claims replaces all prior versions and listings of claims in the application.

1. (Currently amended): A diboride single crystal substrate that is a single crystal substrate of diboride XB_2 (where X is either Zr or Ti), characterized in that the substrate is facially oriented in a (0001) plane, ~~and has a thickness of 0.1 mm or less~~ has a orientation flat exhibiting a (10-10) or (11-20) plane and has a thickness of 0.1mm or less whereby the substrate can be cleaved in a (10-10) plane.

2. (Canceled)

3. (Currently amended): A semiconductor laser diode, ~~characterized in that it~~ having a multilayered active layer is formed on a substrate of diboride XB_2 single crystal (where X is either Zr or Ti) ~~and that the substrate is facially oriented in a (0001) plane of the single crystal~~ which is facially oriented in a (0001) plane of the single crystal, characterized in that a pair of opposed end faces defining a semiconductor laser light resonator in the multilayered active layer and opposed end faces of the diboride XB_2 single crystal substrate are each constituted by a cleavage face oriented parallel to a (10-10) plane of the diboride XB_2 single crystal substrate.

4. (Canceled)

5. (Currently amended): A semiconductor laser diode as set forth in claim 3 ~~or claim 4~~, characterized in that the diboride XB_2 single crystal substrate has a thickness of 0.1 mm or less.

6. (Currently amended): A semiconductor laser diode as set forth in ~~any one of claims 3 to 5~~ claim 3 or claim 5, characterized in that the diboride XB_2 single crystal substrate is a ZrB_2 single crystal substrate, and that the multilayered active layer of the semiconductor laser diode comprises a nitride compound semiconductor ($Al_xGa_yIn_zN$ where $x + y + z = 1$).

7. (Currently amended): A semiconductor device that is formed on a substrate of a diboride XB_2 single crystal (where X is Zr or Ti) which is facially oriented in a (0001) plane of the single crystal, ~~characterized in that: the diboride XB_2 single crystal substrate has a pair of cut faces resulting from cutting a said substrate upon scribing it with a diamond pen or the like along a (10-10) plane; and~~

~~a semiconductor device constituting the device has side faces at least one of which is parallel to the (10-10) plane of the diboride XB_2 single crystal substrate~~ characterized in that those at least at one side of side faces of the diboride XB_2 single crystal substrate and of a device constituting a semiconductor device are constituted by cut faces resulting from cleaving the substrate and the device parallel to a (10-10) plane of the diboride XB_2 single crystal substrate.

8. (Original): A semiconductor device as set forth in claim 7, characterized in that the semiconductor device is a semiconductor laser diode.

9. (Original): A semiconductor device as set forth in claim 7, characterized in that the semiconductor device is a light emitting diode.

10. (Original): A semiconductor device as set forth in claim 7, characterized in that the semiconductor device is a photo detector.

11. (Original): A semiconductor device as set forth in claim 7, characterized in that the semiconductor device is a heterojunction bipolar transistor.

12. (Original): A semiconductor device as set forth in claim 7, characterized in that the semiconductor device is a field effect transistor.

13. (Original): A semiconductor device as set forth in claim 7, characterized in that the semiconductor device is an integrated circuit.

14. (Currently amended): A semiconductor device as set forth in ~~claim 7~~ any one of claims 7 to 13, characterized in that the diboride XB_2 single crystal substrate has a thickness of 0.1 mm or less.

15. (Currently amended): A semiconductor device as set forth in ~~any one of claims 7 to 14~~ claim 7, characterized in that the diboride XB_2 single crystal substrate is a ZrB_2 single crystal substrate and the semiconductor device comprises a nitride compound semiconductor ($Al_xGa_yIn_zN$ where $x + y + z = 1$).

16. (Original): A method of making a semiconductor laser diode, characterized in that it comprises the steps of:

forming active layers of the semiconductor laser diode on a substrate of a diboride XB_2 single crystal (where X is Zr or Ti) that is facially oriented in a (0001) plane of the single crystal; and

scribing the diboride XB_2 single crystal substrate along a (10-10) plane thereof and cutting the semiconductor device's active layers together with the substrate into a plurality of their divisions each individually constituting a semiconductor laser diode.

17. (Original): A method of making a semiconductor laser diode as set forth in claim 16, characterized in that prior to the step of scribing the diboride XB_2 single crystal substrate along a (10-10) plane thereof and cutting the semiconductor device's active layers together with the substrate into a plurality of their divisions, the method further includes the step of thinning the diboride XB_2 single crystal substrate to 0.1 mm or less in thickness.

18. (Original): A method of making a semiconductor laser diode as set forth in claim 16, characterized in that the diboride XB_2 single crystal substrate is thinned to a thickness of 0.1 mm or less.

19. (Original): A method of making a semiconductor laser diode as set forth in any one of claims 16 to 18, characterized in that the diboride XB_2 single crystal substrate is a ZrB_2 single crystal substrate and the semiconductor laser diode has multiple active layers made of a nitride compound semiconductor ($Al_xGa_yIn_zN$ where $x + y + z = 1$).

20. (Original): A method of making a semiconductor device, characterized in that it comprises the steps of:

forming a semiconductor device on a substrate of a diboride XB_2 single crystal (where X is either Zr or Ti) that is facially oriented in a (0001) plane of the single crystal; and

dividing the semiconductor device on the diboride XB_2 single crystal substrate by cutting the device parallel to a (10-10) plane of the diboride XB_2 single crystal substrate.

21. (Original): A method of making a semiconductor device as set forth in claim 20, characterized in that the step of cutting the device comprises cleaving.

22. (Original): A method of making a semiconductor device as set forth in claim 20 or claim 21, characterized in that prior to the step of dividing the semiconductor device on the diboride XB_2 single crystal substrate by cutting the device parallel to a (10-10) plane of the diboride XB_2 single crystal substrate, the method further comprises the step of thinning the diboride XB_2 single crystal substrate to 0.1 mm or less in thickness.

23. (Original): A method of making a semiconductor device as set forth in claim 20 or claim 21, characterized in that the diboride XB_2 single crystal substrate is thinned to a thickness of 0.1 mm or less.

24. (Currently amended): A method of making a semiconductor device as set forth in ~~any one of claims 20 to 23~~ claim 20, characterized in that the diboride XB_2 single crystal substrate is a ZrB_2 single crystal substrate and the semiconductor device is made of a nitride compound semiconductor ($Al_xGa_yIn_zN$ where $x + y + z = 1$).